

Dendrobates tinctorius
(2 White morph variants).

AMERICAN DENDROBATID GROUP

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Literature review of the *Dendrobates quinquevittatus* Species Group

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Introduction

Much confusion has surrounded the *Dendrobates quinquevittatus* species group of poison frogs in recent years and espically the name *D. quinquevittatus*. It was not until 1982 that Myers named the *D. quinquevittatus* species group based on similar distinctive limb reticulations and included four species in it: *D. quinquevittatus*, *D. fantasticus*, *D. reticulatus*, and *D. vanzolinii*. Earlier Silverstone (1975) included *D. quinquevittatus* as part of his *D. minutus* species group and synomized *D. quinquevittatus*, *D. ventrimaculatus sensus* Caldwell and Myers (1990), *D. fantasticus*, *D. igneus* and *D. reticulatus* with it. Myers (1982) pointed out that Silverstone's use of the name *D. quinquevittatus* included at least five separate species. He reserected two older names, *D. fantasticus* and *D. reticulatus*, then he described two new species *D. captivus* and *D. vanzolinii* and implied the existance of still another species. *Dendrobates captivus* is not considered part of the *D. quinquevittatus* species group. Caldwell and Myers (1990) refined the group by describing a new species, *D. castaneoticus*, and redefined *D. quinquevittatus* restricting it to a very distinctive frog from Brazil. They further refined the group resurrecting the name *D. ventrimaculatus* and applied it to all specimens which had previously been called *D. quinquevittatus*, with the exception of *D. quinquevittatus sensu strictu (s.s.)*. As defined now *D. ventrimaculatus* represents a composite species from which Morales (1992) separated *D. biolat* and from which a number of other species will be separated in the future.

The following is a brief description of all known species and resurection of an obsolete name. These species, and others to follow (which will be named in the future), have a wide distribution from the Amazonian drainages of Colombia, Ecuador, Peru, and Brazil, and north into French Guiana. In this paper the following size ranges are used: very small (10-15 mm), small (16-18 mm), medium (19-25 mm).

Taxa

Dendrobates biolat Morales, 1992

A very small to small (11.7 to 17 mm) dendrobatid with three longitudinal yellow lines, the middle of which extends from the nose to the vent. The two supralabial lines curve out from the middle line over the eyes and extent to the groin region. These stripes appear to form a three pronged pitch-fork with the tines towards the rear. The groin and thighs have clear yellow spots and the extremities are yellow with small black spots. *Dendrobates biolat* is most similar to *D. lamasi* but differs in being smaller, that the vertebral (center) line meets the supralabials and the yellow background coloration of the extremities. This species occurs in the Manu Biosphere Reserve, Tahuamanu Province and Tambopata Reserve, Tambopata Province, Peru at elevations between 290 m and 340 m (Morales, 1992).

Dendrobates castaneoticus Caldwell and Myers, 1990

A medium sized dendrobatid (18 to 23 mm SVL) with a variable color pattern of mainly incomplete, vivid white lenticular markings on a black body with brilliant orange to golden spots on the limb intersections. This distinctive color pattern sets this species apart from all other species in the *quinquetittatus* group. It also doesn't have the reticulated legs distinctive of this species group, but its very similar to *D. quinquivittatus* with the tadpoles being nearly indistinguishable. It occurs only in the vicinity of the type locality, on the south side of the Amazon River in the state of Pará, northern Brazil. (Caldwell and Myers, 1990).

Dendrobates fantasticus Boulenger, 1883

A small to medium size dendrobatid (17 to 20 SVL) with two color forms illustrated in recent publications. One has a yellow head with a black pattern in the middle of the head and irregular black marks on a white background starting behind the arms. The second form is yellow with large fairly regular black marks over the body and extrimities. According to Kneller, (1982, 1983) *D. fantasticus* lives in forests in the eastern ranges of the Peruvian Andes in the province of San Martín. It occurs in trees at least 1.4 m above the ground at elevations between 500 m and 800 m (Heselhaus, 1992).

Dendrobates imitator Schulte 1986

A small dendrobatid with a yellow, orange, or golden colored body and black circular to irregular makes on the back. The limbs are light blue with black reticulation. Schulte (1986) states that *D. imitator* is a Muellertian mimic of a special morph of *D. quinquetittatus* (sic. *variabilis*) being nearly identical in size and color and differing in its breeding biology, call, and the development of its first toe (*D. variabilis* has a stubby first toe, while *D. imitator* has a well developed one). It occurs in the Cordilleras of northeast Peru at moderately low elevations (Holotype collected from 550 m). This seems to be the most commonly kept species in the *quinquivittatus* group in the USA.

Dendrobates igneus Melin, 1941

A very small dendrobatid described from only 2 specimens which measure 16 mm. Melin's described this species as "highly orange-coloured with longitudinal, partly interrupted black bands: two medial ones starting in front of the eyes, interrupted on the shoulders, and one dorsal one on the flanks; the latter, limbs, and lower surface with reticulated light blue design, including numerous

rounded black spots." Silverstone (1975) synonymised it with *D. quinquivittatus* which as redefined by Caldwell and Myers (1990) did not include this species, but it was also not included in their synonymy of *D. ventrimaculatus*. At present its taxonomic status is uncertain, but should probably be synonymised with the composite species *D. ventrimaculatus*. Melin (1941) reported its occurrence from Rio Itaya (near Iquitos) in Peru. According to Charles Nishihara this is the region where *D. reticulatus* is found. In recent years a few quinquivittatus group frogs which match Merlins description have been imported with large numbers *D. reticulatus*. These specimens are the same color as *D. reticulatus* and nearly the same size, but differ in the incomplete black lines on the back. I believe these frogs are referable to *D. igneus*. A picture which probably represent this frog can be found in Rodríguez and Duellman (1994) plate 2, figure D under the name *D. ventrimaculatus*.

Dendrobates lamasi Morales, 1992

A small to medium dendrobatid (16 to 19 mm SVL) with a black body and 3 clear yellow, longitudinal lines the center of which terminates at a line that runs across the body in front of both eyes and runs to the vent. The lateral lines runs from the shoulders and curve to meet a transverse line on the back. From this transverse line run two lines further down the legs. The legs have small black spots on a bluish-gray background. This species can be distinguished from *D. biolai* Morales, by its larger size, different pattern on the back, and structures of the head and hands. Morales (1992) reported it occurring in moist tropical premontane forests at Tingo Maria, Leoncio Prado Province, Huánuco and Bosque Castilla, Huancabamba Province, state of Pasco, Peru, at elevations between 345 and 672 m. An interesting point is that Morales (1992) states that it ends its diurnal activity at about 1300 to 1400 hours (1 to 2 in the afternoon!) (Morales, 1992).

Dendrobates quinquivittatus Fitzinger in Steindachner, 1864 *sensu* Caldwell and Myers, 1990

A small to medium dendrobatid (maximum length of about 20 mm SVL) with a black body and five pale, fairly narrow stripes (light blue to greenish to yellowish white). A pale blue throat and venter with irregular black markings, and orange arms and legs with well separated small black spots at least on the dorsal limb surface. This species shares with *D. castaneoticus* the presence of an iridescent orange or golden spot at the dorsal limb intersection, nearly identical tadpoles and the use of fallen rain-filled fruit capsules of the Brazil nut tree. As defined by Caldwell and Myers this species occurs only in southern Amazonia and in the Rio Madeira drainage of western Brazil. (Caldwell and Myers, 1990).

Dendrobates reticulatus Boulenger, 1883

This is a very small to small dendrobatid (14 to 16.5 mm SVL) with distinct red orange spots which extends over the entire upper third of the body. This is followed by a regular dot pattern on a blue-gray background which also occurs on the extremities. *Dendrobates reticulatus* is found in the Cordillera Central in north-eastern Peru at elevations between sea level and 800 m. Heselerhaus (1992) states that the frogs prefer the edges of primary forests or cleared woodlands living on bromeliads and large leaf plants.

Dendrobates sirensis Aichinger, 1991

A very small to small frog (15 to 17 mm SVL) with a dark red body and turquoise-green arms

and legs. Aichinger (1991) placed this taxon tentatively in the *quinquetittatus* group based on its arboreal habitat (indicated by its relatively long hands with well developed discs) and the females laying only a few eggs (the type (a female) contained 2 eggs). It is my guess that this species should be removed from the *quinquetittatus* species group and placed in the genus *Minyobates*, but this will have to wait for further study by qualified scientists. It is known only from lowland rainforests from, 260 m to 1,050 m from Serrania de Sira in east-central Peru.

Dendrobates vanzolinii Myers, 1982

A small to medium dendrobatid (16 to 19 mm SVL) with a black body and yellow to cream rounded or elongated spots dorsally. The legs and arms show a network of pale bluish gray to very pale brown which gives the appearance of round black or brown spots on a pale background. The spotted dorsum (light on dark) distinguishes this species from others of the *quinquevittatus* group. This is part of pattern 3 of Silverstone's (1975) *D. quinquevittatus*. *Dendrobates vanzolinii* occurs in east-central Peru and adjacent Brazil, in the upper Ucayali and Juruá rivers. (From Myers, 1982).

Dendrobates ventrimaculatus Shreve, 1935 *s.l.* (fide Caldwell and Myers, 1990)

This name is used for the diverse populations of *quinquevittatus* group frogs which still remain unnamed. It is a composite species whose successful taxonomic treatment will depend on studies of intrapopulational and geographic variations of all characteristic. As defined this species ranges from Ecuador and Peru to the Guianas. At least 3 diverse populations live in Peru which in the future will probably be given distinct names (including *D. ventrimaculatus s.s.*, *D. igneus*, and *D. variabilis*).

Dendrobates variabilis Zimmermann and Zimmerman, 1980

A small dendrobatid (15.5 mm to 17.8 mm) with back and sides of bright green to yellow with rounded often interconnected black spots over the dorsum and with only a single spot over its nose. The front and hind legs are green with small black spots.

Zimmermann and Zimmermann (1988) named "*Dendrobates variabilis*" for one of the Peruvian populations of *quinquevittatus* group frogs without providing a type locality other than "Departamento San Martin, Peru" (an area of 45,000 km² fide Caldwell and Myers, 1990). Caldwell and Myers (1990) suggest that *D. variabilis* is a distinct species in the complex, but refer the name to synonymy with *D. ventrimaculatus* until sufficient evidence is available to differentiate it from other populations of *D. ventrimaculatus s.l.*

Summary

As currently defined the *D. quinquevittatus* species group includes eight species: *D. biolat*, *D. castaneoticus*, *D. fantasticus*, *D. imitator*, *D. lamasi*, *D. quinquevittatus s.s.*, *D. reticulatus*, and *D. vanzolinii*. *Dendrobates igneus* and *D. variabilis* are, at present, invalid names which are likely to be reapplied to specific frogs from Peru at a future time. It is my opinion that *D. sirensis* should not be included here and is probably a *Minyobates* as defined by Myers (1987). *Dendrobates ventrimaculatus* includes all other frogs which are not assignable to present species but which belong in the *D. quinquevittatus* species group, this could include as many as a half dozen species, possibly more.

I would like to thank Dr. Jack Frenkel for reviewing the article and for his excellent translations of foreign articles. Barbara Powell for reviewing the article and Charles Nishihara for supplying me with significant literature.

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NEW LITERATURE

Dendrobatids

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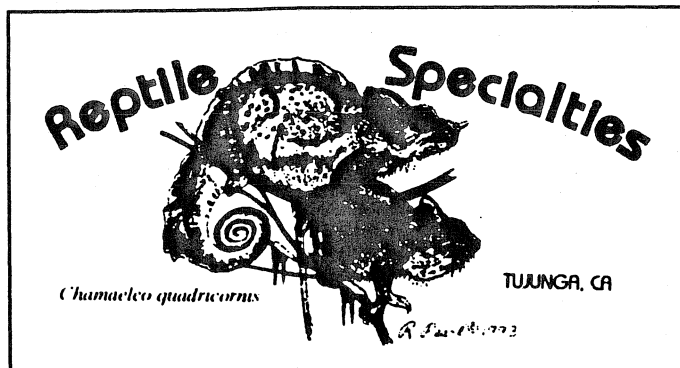
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Mantellids

Zimmermann, Elke and Zimmermann, Helmut, 1994, Reproductive strategies, breeding, and conservation of tropical frogs: dart-poison frogs and Malagasy Poison frogs. In J. B. Murphy, K. Adler, and J. T. Collins, eds., *Captive Management and Conservation of Amphibians and Reptiles*. Society for the study of Amphibians and Reptiles, Ithaca (New York). *Contributions to Herpetology*, 11: 255-266.

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